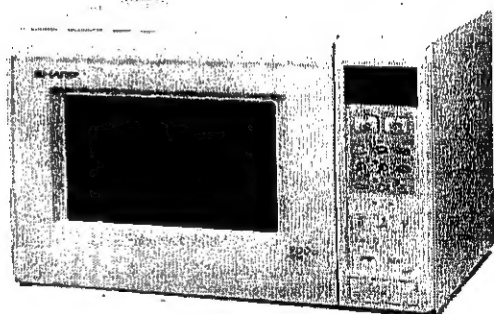


SHARP® SERVICE MANUAL

SX306R3A65PHW



R-3A65(W)

MICROWAVE OVEN

MODELS **R-3A65(W)**
R-3A65(B)

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

CAUTION MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured.

Never operate the device without a microwave energy absorbing load attached.
Never look into an open waveguide or antenna while the device is energized.

VARNING MICKROVAGSSTRÅLING

Personal får inte utsättas för mikrovågsenergi som kan stråla från magnetronen eller andre mikrovågsstrålande anordningar om dessa är felanslutna eller används på fel sätt. Alla in- och utgångsanslutningar för mikrovågor, vågledare, flänsar och packningar måste vara fast anslutna.

Mikrovågsgeneratoren får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i en öppen vågledare eller antenn när mikrovågsgeneratoren är påkopplad eller laddad.

VAROITUS MIKROAALTOSÄTELYÄ

Käyttäjä ei saa joutua alttiiksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään tai jos se kytketään väärin. Kaikkien mikroaaltoliitännöiden sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivisteiden tulee olla varmistettuja.

Mikroaaltouunnia ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu. Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

ADVARSEL MIKROBØLGESTRÅLING

Personell må ikke utsettes for mikrobølge-energi som kan utståles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet. Alle inn-og ut-tilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.

Aldri bruk apparatet med mindre en mikrobølge-absorberende last er plassert i ovnsrommet.

Aldri se direkte inn i en åpen bølgeleder eller antenne imens apparatet er strømførende.

ADVARSEL MIKROBØLGEBESTRÅLING

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og-udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.

Anvend aldrig ovnen uden en mikrobølgesabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antenne, mens ovnen er i brug.

SERVICE MANUAL

SHARP

MICROWAVE OVEN

R-3A65(W)/ R-3A65(B)

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

WARNING

- Note:** The parts marked "*" are used in voltage more than 250V. (Parts List)
- Anm:** Delar märket med "*" har en spänning överstigande 250V.
- Huom:** Huolto-ohjeeseen merkitty "tähdellä" osat joissa jännite on yli 250 V.
- Bemerk:** Deler som er merket "asterisk" er utsatt for spenninger over 250V til jord.
- Bemærk:** "Dele mærket med stjerne benyttes med højere spænding end 250 volt.

WARNING

- Never operate the oven until the following points are ensured.
- (A) The door is tightly closed.
 - (B) The door latches and hinges are not defective.
 - (C) The door is not deformed or warped.
 - (D) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

SHARP CORPORATION

OSAKA, JAPAN

PRODUCT SPECIFICATIONS

GENERAL INFORMATION

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT COMPONENTS

SERVICING AND TROUBLESHOOTING CHART

TEST PROCEDURE

TOUCH CONTROL PANEL ASSEMBLY

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT






TEST DATA AT A GLANCE

WIRING DIAGRAM

PARTS LIST

PRODUCT DESCRIPTION

SPECIFICATION

| ITEM | DESCRIPTION |
|---------------------------|--|
| Power Requirements | 220-230 Volts 50 Hertz Single phase, 3 wire grounded |
| Power Consumption | 1.45 kW Approx. 6.3 A |
| Power Output | 900 W watts nominal of RF microwave energy (measured by way of IEC 705) |
| Case Dimensions | Width 450 mm Height 295 mm including foot Depth 361 mm |
| Cooking Cavity Dimensions | Width 285 mm Height 178 mm Depth 313 mm |
| Turntable diameter | 272mm |
| Control Complement | <p>Touch Control System</p> <p>Clock (1:00– 12:59 or 0:00– 23:59)</p> <p>Timer (0–99 minutes 90 seconds)</p> <p>99 minutes 90 seconds</p> <p>Microwave Power for Variable Cooking Repetition Rate;</p> <p>  HIGH Full power throughout the cooking time  MEDIUM HIGH approx. 70% of FULL Power  MEDIUM approx. 50% of FULL Power  MEDIUM LOW approx. 30% of FULL Power  LOW approx. 10% of FULL Power </p> <p>POTATO pads</p> <p>INSTANT ACTION pads</p> <p>MORE/LESS pads</p> <p>POWER SETTING pad</p> <p>STOP pad</p> <p>MINUTE TIMER/HOLD pad</p> <p>Time pads</p> <p>MINUTE PLUS/START pad</p> <p>CLOCK SETTING pad</p> |
| Set Weight | Approx. 16.0kg |

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

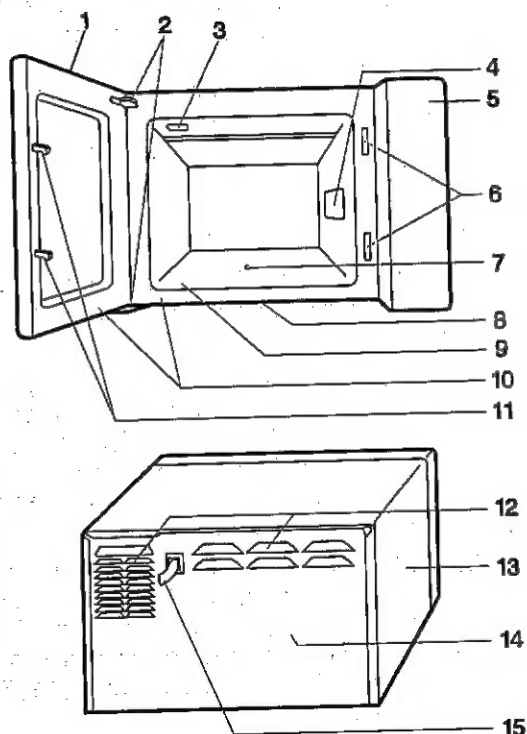
IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

| | |
|------------------|-----------|
| GREEN-AND-YELLOW | : EARTH |
| BLUE | : NEUTRAL |
| BROWN | : LIVE |

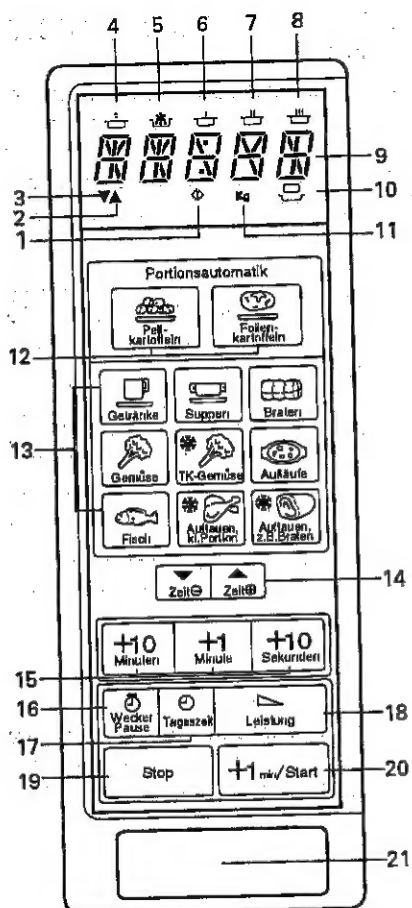
APPEARANCE VIEW

OVEN



1. Door
2. Door hinges
3. Oven lamp
4. Waveguide cover
5. Control panel
6. Door lock openings
7. Coupling
8. Ventilation openings
9. Oven cavity
10. Door seals and sealing surfaces
11. Safety door latches
12. Ventilation openings
13. Outer cabinets
14. Rear cabinets
15. Power supply cord

AUTO-TOUCH CONTROL PANEL



DISPLAY AND INDICATORS

Check indicators after the oven starts to confirm the oven is operating as desired.

1. Cook indicator
This indicator shows cooking in progress.
2. MORE indicator
3. LESS indicator
4. LOW
5. MEDIUM LOW
6. MEDIUM
7. MEDIUM HIGH
8. HIGH
9. Digital display
10. Number indicator
11. Units of weight indicator

OPERATING KEYS

12. POTATO keys
13. INSTANT ACTION keys
14. MORE (▲)/LESS (▼) keys
15. Time keys
16. MINUTE TIMER/HOLD key
17. CLOCK SETTING key
18. Power level setting key
19. STOP key
20. MINUTE PLUS/START key
21. Door open button (▽)

OPERATION SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (1st latch switch, 2nd latch switch, 3rd latch switch and stop switch).

IMPORTANT:

When the oven door is closed, the monitor switch contacts COM-NC must be open.

When the microwave oven is plugged in a wall outlet (220-230V 50Hz), the line voltage is supplied to the point A3+A5 in the control unit.

Figure O-1 on page 29

1. The display flashes "88:88".
2. To set any programmes or set the clock, you must first touch the STOP pad.
3. " : " appears in the display and the time counts up every minute.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time with the touching Time pad and start the oven with touching START pad.

Function sequence Figure O-2 on page 29

| CONNECTED COMPONENTS | RELAY |
|---------------------------------------|-------|
| Oven lamp, Fan motor, Turntable motor | RY1 |
| High voltage transformer | RY2 |

1. The line voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channeled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY1+RY2 go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and turntable motor are cut off.
When the door is opened during a cook cycle, the switches come to the following condition.

| CONDITION | | | |
|------------------|---------|----------------|------------------------|
| SWITCH | CONTACT | DURING COOKING | DOOR OPEN (NO COOKING) |
| 1st latch switch | COM-NO | Closed | Open |
| Monitor switch | COM-NC | Open | Closed |
| 2nd latch switch | COM-NO | Closed | Open |
| Stop switch | COM-NO | Closed | Open |
| 3rd latch switch | COM-NO | Closed | Open |

The circuits to the high voltage transformer, fan motor and turntable motor are cut off when the 1st latch switch, 2nd latch switch, 3rd latch switch and stop switch are made open.

The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stays closed. Shown in the display is the remaining time.

6. MONITOR SWITCH CIRCUIT

The monitor switch SW4 is mechanically controlled by oven door, and monitors the operation of the 1st latch switch SW1.

- 6-1. When the oven door is opened during or after the cycle of a cooking program, the 1st latch, 2nd latch, and 3rd latch switches SW1+SW2+SW3 must open their contacts first. After that the contacts (COM-NC) of the monitor switch SW4 can be closed and then contacts of the stop switch SW5 can be opened.
- 6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch SW4 must be opened and the contacts (COM-NO) of the stop switch SW5 must be closed first. After that the contacts of the 1st latch, 2nd latch and 3rd latch switches SW1+SW2+SW3 are closed.
- 6-3. When the oven door is opened and the contacts of the 1st latch switch SW1 remain closed, the weak point E A019 will blow, because the monitor switch is closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the line voltage is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given.

| SETTING | 32 sec. ON | | |
|-------------|------------|-------------|-------------|
| HIGH | 32 sec. ON | | |
| MEDIUM HIGH | 24 sec. ON | 8 sec. OFF | Approx. 70% |
| MEDIUM | 18 sec. ON | 14 sec. OFF | Approx. 50% |
| MEDIUM LOW | 12 sec. ON | 20 sec. OFF | Approx. 30% |
| LOW | 6 sec. ON | 26 sec. OFF | Approx. 10% |

NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by pushing the open button on the control panel. When the open button is pushed, the switch lever on the latch hook is moved upward, operating the latch head. The latch head is moved upward, and released from the latch hook. Now, the door can be opened.

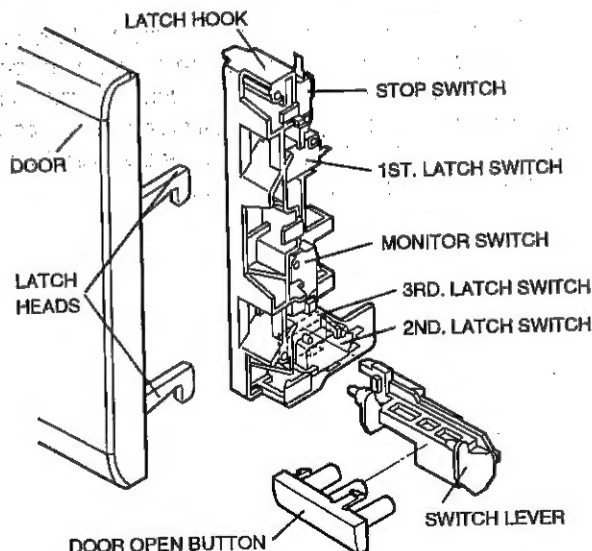


Figure D-1. Door Open Mechanism

1ST LATCH SWITCH SW1

2ND LATCH SWITCH SW2

STOP SWITCH SW5

3RD LATCH SWITCH SW3

1. When the oven door is closed, the contacts (COM-NO) must be closed.
2. When the oven door is opened, the contacts (COM-NO) must be opened.

MONITOR SWITCH SW4

1. When the oven door is closed, the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NC) must be closed.

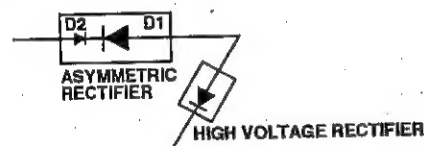
CAUTION: BEFORE REPLACING A BLOWN WEAK POINT F TEST THE 1ST LATCH SWITCH SW1, MONITOR SWITCH SW4 AND MONITOR RESISTOR R1 FOR PROPER OPERATION.(REFER TO CHAPTER "TEST PROCEDURE".)

MONITOR RESISTOR R1 4.3Ω 20W

The monitor resistor prevents the weak point E bursting when the weak point E blows due to the operation of the monitor switch.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is a solid state device that prevents current flow in both directions. And it prevents the temperature rise of the high voltage transformer by blowing the weak point E when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of blowing the weak point E.)

1. The high voltage rectifier is shorted by any causes when microwave cooking or dual cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents beyond 7.4A flow through the primary winding of the high voltage transformer.
6. The weak point E blows by the large electric currents.
7. The power supply to the high voltage transformer is cut off.

WEAK POINT F A019

1. The weak point E blows when the contacts (COM-NO) of the 1st latch switch SW1 remain closed with the oven door open and when the monitor switch SW4 closes.
2. The weak point E also blows when asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of high voltage transformer is shorted.
3. If the wire harness or electrical components are short-circuited, the weak point E blows to prevent an electric shock or fire hazard.

TEMPERATURE FUSE TF1 150°C (MG)

This fuse protects the magnetron against overheating. If the temperature goes up higher than 150°C because the fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the fuse blows and cuts off the power supplying to the high voltage transformer. The defective fuse must be replaced with new rated one.

TEMP. FUSE TF2 150°C (OVEN)

The temp. fuse located on the top of the oven cavity is designed to prevent damage to the oven if the foods in the oven catch fire due to over heating produced by improper setting of cook time or failure of control unit. Under normal operation, the temp. fuse remains closed. However, when abnormally high temperatures are reached within the oven cavity, the temp. fuse will open at 150°C, causing the oven to shut down. The defective fuse must be replaced with a new one.

THERMAL CUT-OUT 95°C TC

The thermal cut-out protect the fan motor against overheat. If its temperature goes up higher than 95°C because the fan motor is locked or the ventilation openings are blocked, the contacts of the thermal cut-out TC will open and switches off the oven.

When the oven cools itself down to 75°C, the contacts of the thermal cut-out will close again.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

TURNTABLE MOTOR TTM

The turntable motor drives the roller stay to rotate the turntable.

FAN MOTOR FM

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapors given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current. Contact with following parts will result in electrocution.

High voltage capacitor, High voltage transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK **3D**

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the high voltage transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the high voltage transformer.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and microwave leakage test carried out.

REMEMBER TO CHECK **4R**

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power level to HIGH. And set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown weak point E in the 1st latch switch - monitor switch - monitor resistor circuit, check the 1st latch switch, monitor switch and monitor resistor before replacing the weak point E.

[illegible]

TEST PROCEDURES

PROCEDURE
LETTER

COMPONENT TEST

A

MAGNETRON TEST

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECK

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (IEC-705)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately $P \times t / 4.187$ calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT ($^{\circ}\text{C}$) during this microwave heating period, the calorie of the water is $V \times \Delta T$.

The formula is as follows;

$$P \times t / 4.187 = V \times \Delta T \quad P(W) = 4.187 \times V \times \Delta T / t$$

Our condition for water load is as follows:

Room temperature.....around 20°C Power supply Voltage.....Rated voltage
Water load.....1000 g Initial temperature..... $10 \pm 2^{\circ}\text{C}$ Heating time.....47 sec.
 $P = 90 \times \Delta T$

Measuring condition:

1. Container
The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water
The initial temperature of the water is $(10 \pm 2)^{\circ}\text{C}$.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and accurate thermometer.
7. The water load must be (1000 ± 5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heat-up time.

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.
(Example: The initial temperature $T_1 = 11^{\circ}\text{C}$)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of (10 ± 2) K.
5. Stir the water to equalize temperature throughout the vessel.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

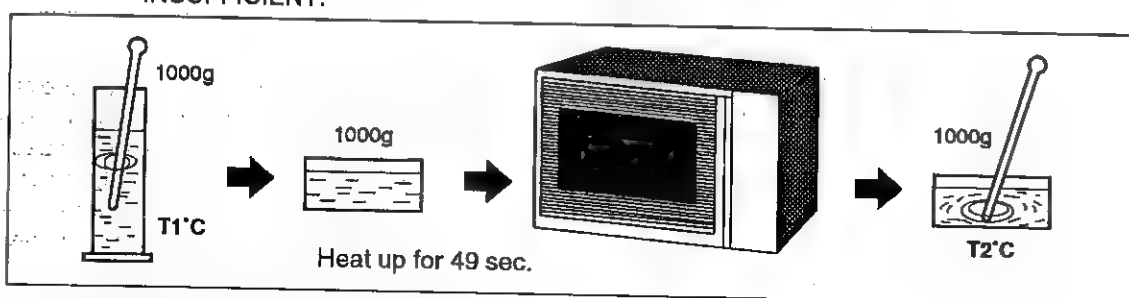
COMPONENT TEST

6. Measure the final water temperature. (Example: The final temperature $T_2 = 21^\circ\text{C}$)
7. Calculate the microwave power output P in watts from above formula.

Initial temperature $T_1 = 11^\circ\text{C}$
 Temperature after $(47 + 2) = 49$ sec. $T_2 = 21^\circ\text{C}$
 Temperature difference Cold-Warm $\Delta T_1 = 10^\circ\text{C}$
 Measured output power
 The equation is " $P = 90 \times \Delta T$ " $P = 90 \times 10^\circ\text{C} = 900$ Watts

JUDGMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 90 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B

HIGH VOLTAGE TRANSFORMER TEST

WARNING: High voltages and large currents are present at the secondary winding and filament winding transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS

Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:-

| | |
|----------------------|-------------------------|
| a. Primary winding | 1.34 ohms approximately |
| b. Secondary winding | 96.9 ohms approximately |
| c. Filament winding | less than 1 ohm |

If the reading obtained are not stated above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

C

HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

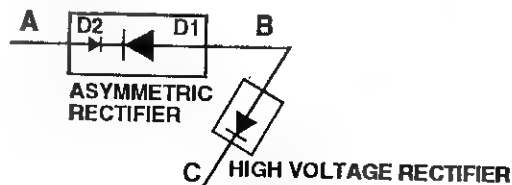
CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 k Ω in the other direction.

CARRY OUT 4R CHECKS

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.



TEST PROCEDURES (CONT'D)

PROCEDURE
LETTER

COMPONENT TEST

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both direction then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the high voltage transformer is shorted.

CARRY OUT 4R CHECKS

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D

HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS

- A. Isolate the high voltage capacitor from the circuit.
- B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
- D. A short-circuited capacitor shows continuity all the time.
- E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
- F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
- G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal. If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS

E

SWITCH TEST

CARRY OUT 3D CHECKS

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

| Plunger Operation | COM to NO | COM to NC |
|-------------------|-----------|-----------|
| Released | O.C. | S.C. |
| Depressed | S.C. | O.C. |

COM; Common terminal, NO; Normally open terminal NC; Normally close terminal
S.C.; Short, O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch or replace the switch.

CARRY OUT 4R CHECKS.

F

MONITOR RESISTOR TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the monitor resistor.
Using an ohmmeter and set on a low range.
Check between the terminals of the monitor resistor as described in the following table.

Table: Resistance

| Resistor | Resistance |
|------------------|--------------|
| Monitor resistor | Approx. 4.3Ω |

If incorrect readings are obtained, replace the monitor resistor.

CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

COMPONENT TEST

G

TEMPERATURE FUSE OR THERMAL CUT-OUT TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

CARRY OUT 4R CHECKS

Table: Temperature Fuse or Thermal Cut-out Test

| Parts Name | Temperature of "ON" condition (closed circuit). (°C) | Temperature of "OFF" condition (open circuit). (°C) | Indication of ohmmeter (When room temperature is approx. 20°C.) |
|--------------------------------|--|---|---|
| Temp. fuse 150°C TF 1 and TF 2 | This is not resettable type. | Above 150°C | Closed circuit |
| Thermal cut-out 95°C TC | Below 75°C | Above 95°C | Closed circuit. |

If incorrect readings are obtained, replace the temp. fuse or thermal cut-out.

An open circuit temperature fuse TF1 indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure.

An open circuit temperature fuse TF2 indicates that the oven cavity has overheated, this may be due to no load operation.

An open circuit thermal cut-out 95°C(TC) indicates that the fan motor winding has overheated, this may be due to resisted ventilation or locked cooling fan.

H

MOTOR WINDING TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

| Motors | Resistance |
|-----------------|------------------------|
| Fan motor | Approximately 330 ohms |
| Turntable motor | Approximately 12 kohms |

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS

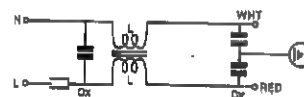
I

NOISE FILTER TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of noise filter.

Using an ohmmeter, check between the terminals as described in the following table.



| L (min) | Cx ± 20% | Cy ± 20% |
|---------|----------|----------|
| 1.0mH | 0.068μF | 0.0033μF |

| MEASURING POINTS | INDICATION OF OHMMETER |
|------------------------------|------------------------|
| Between N and L | Open circuit |
| Between terminal N and WHITE | Short circuit |
| Between terminal L and RED | Short circuit |

If incorrect readings are absorbed, replace the noise filter unit.

CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE
LETTER

COMPONENT TEST

J

WEAK POINTCARRY OUT 3D CHECKS

If the weak point E is blown when the door is opened, check the 1st latch switch, monitor switch and monitor resistor.

If the weak point E is blown by incorrect door switching replace the defective switch(s) and the weak point E.

If the weak point E is blown, there is a short in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may be occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

If the weak point E is blown, there is a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4B CHECKS

CAUTION: Only replace weak point E with the correct value replacement.

K

TOUCH CONTROL PANEL ASSEMBLY TEST

The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter.

In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and troubleshooting by replacement is described according to the symptoms indicated.

1. Key Unit. Note: Check key unit ribbon connection before replacement.

The following symptoms indicate a defective key unit. Replace the key unit.

- a) When touching the pads, a certain pad produces no signal at all.
- b) When touching a number pad, two figures or more are displayed.
- c) When touching the pads, sometimes a pad produces no signal.

2. Control Panel

The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test (Procedure M) to determine if control unit is faulty.

2-1 In connection with pads.

- a) When touching the pads, a certain group of pads do not produce a signal.
- b) When touching the pads, no pads produce a signal.

2-2 In connection with indicators

- a) At a certain digit, all or some segments do not light up.
- b) At a certain digit, brightness is low.
- c) Only one indicator does not light.
- d) The corresponding segments of all digits do not light up; or they continue to light up.
- e) Wrong figure appears.
- f) A certain group of indicators do not light up.
- g) The figure of all digits flicker.

2-3 Other possible problems caused by defective control unit.

- a) Buzzer does not sound or continues to sound.
- b) Clock does not operate properly.
- c) Cooking is not possible.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

COMPONENT TEST

L

RELAY TEST

CARRY OUT 3D CHECKS

Remove the outer case and check voltage between Pin Nos. 3 and 5 of the 3 pin connector (A) on the control unit with an A.C. voltmeter.

The meter should indicate 220-230 volts, if not check oven circuit.

RY1 and RY2 Relay Test

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.

DC. voltage indicated Defective relay.

DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good, control unit is defective.

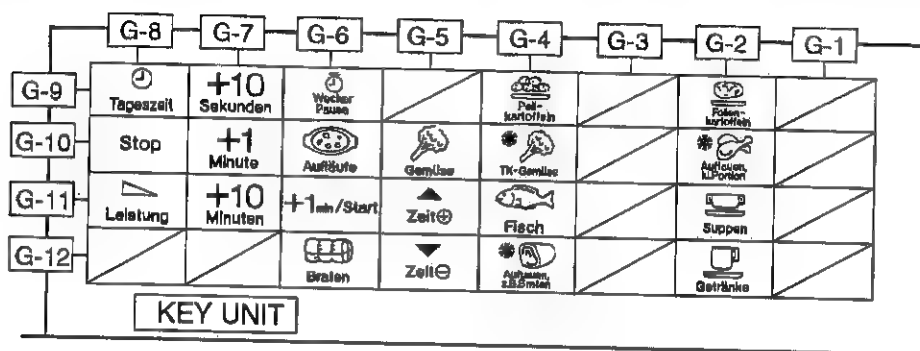
| RELAY SYMBOL | OPERATIONAL VOLTAGE | CONNECTED COMPONENTS |
|--------------|---------------------|---|
| RY-1 | Approx. 18.0V. D.C. | Oven lamp/ Turntable motor/ Coolinf fan motor |
| RY-2 | Approx. 18.0V. D.C. | High voltage transformer |

CARRY OUT 4B CHECKS

M

KEY UNIT TEST

If the display fails to clear when the STOP pad is depressed, first verify the flat ribbon is making good contact; verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connector). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP pad marking momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.



CARRY OUT 4B CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE
LETTER

N

PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD(PWB) IS OPEN

To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

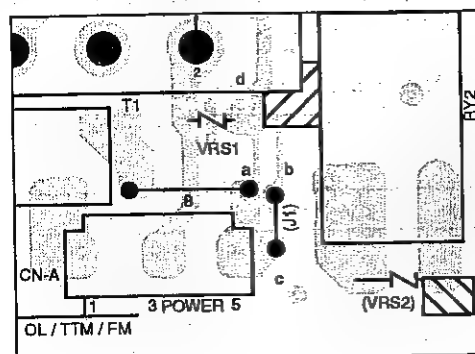
Problem: POWER ON, indicator does not light up.

| STEPS | OCCURANCE | CAUSE OR CORRECTION |
|-------|---|---|
| 1 | The rated AC voltage is not present at POWER terminal of CPU connector (CN-A) | Check supply voltage and oven power cord. |
| 2 | The rated AC voltage is present at primary side of low voltage transformer. | Low voltage transformer or secondary circuit defective. Check and repair. |
| 3 | Only pattern at "a" is broken. | *Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR) |
| 4 | Pattern at "a" and "b" are broken. | *Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR) |

CARRY OUT 3D CHECKS

NOTE: At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.

CARRY OUT 4R CHECKS



TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Key Unit
- (2) Control Unit

The principal functions of these units and the signals communicated among them are explained below.

Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through R10-R13, R20 and R22. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R00-R03 to perform the function that was requested.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit and indicator circuit.

1) LSI

This LSI controls the key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit

This circuit generates voltages necessary in the control unit.

| Symbol | Voltage | Application |
|--------|---------|---|
| VC | -5V | LSI(IC1) |
| VP | -32V | Fluorescent display tube : Grid and anode voltage |
| VF1 | 2.2Vac | Filament of fluorescent display tube |
| VF2 | | (VF1 to VF2 voltage) |

3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL Circuit

A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit noticing sounds (key touch sound and completionsound).

6) Door Sensing Switch (Stop Switch)

A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit

To drive the magnetron, fan motor, turntable motor and light the oven lamp.

8) Indicator Circuit

Indicator element is a Fluorescent Display.

Basically, a Fluorescent Display is triode having a cathode, a grid and an anode. Usually, the cathode of a Fluorescent Display is directly heated and the filament serves as cathode.

The Fluorescent Display has 6-digits, 13-segments are used for displaying figures.

DESCRIPTION OF LSI

LSI(IZA503DR)

The I/O signal of the LSI(IZA503DR) is detailed in the following table.

| Pin No. | Signal | I/O | Description |
|---------|----------|-------|--|
| 1 | Vdisp | IN | Anode (segment) of Fluorescent Display illumination voltage: -32V Vp voltage of power source circuit input. |
| 2 | R00 | IN | Signal coming from touch key. When either one of G12 line keys on key matrix is touched, a corresponding signal will be input into R00. |
| 3 | R01 | IN | Signal coming from touch key. When either one of G11 line keys on key matrix is touched, a corresponding signal will be input into R01. |
| 4 | R02 | IN | Signal coming from touch key. When either one of G10 line keys on key matrix is touched, a corresponding signal will be input into R02. |
| 5 | R03 | IN | Signal coming from touch key. When either one of G9 line keys on key matrix is touched, a corresponding signal out of R20 and R22, R10-R13 will be input into R03. When no key is touched, the signal is held at "L" level. |
| 6 | TEST | IN | Connected to VC. |
| 7 | RESET | IN | Auto clear terminal. Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is set. Thereafter set at "H" level. |
| 8 | OSC1 | IN | Internal clock oscillation frequency input setting. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to OSC1 terminal. |
| 9 | OSC2 | OUT | Internal clock oscillation frequency control output. Output to control oscillation input of OSC2. |
| 10/11 | GND/AVSS | IN/IN | Connected to VC. |
| 12 | AN0 | OUT | Oven lamp, turntable motor and cooling fan motor driving signal. (Square Waveform : 50Hz) To turn on and off the control relay. The pulse signal (50Hz) is delivered to the control relay driving circuit and cook relay control circuit. |
| 13 | AN1 | OUT | Terminal not used. |
| 14 | AN2 | OUT | Magnetron high-voltage circuit driving signal. To turn on and off the cook relay. In Low operation, the signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (MED HIGH, MED, MED LOW, LOW) the signal turns to "H" level and "L" level in repetition according to the power level. |
| 15 | AN3 | OUT | Terminal not used. |
| 16 | AN4 | IN | Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal. Door opened; "L" level signal. |
| 17-19 | AN5-AN7 | IN | Connected to VC. |
| 20/21 | AVCC/VCC | IN/IN | Connected to GND. |
| 22 | INT0 | IN | Signal synchronized with commercial source frequency(50Hz). This is basic timing for time processing of LSI. |
| 23 | D1 | OUT | Terminal not used. |
| 24 | D2 | OUT | Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display. |

| Pin No. | Signal | I/O | Description |
|---------|--------|-----|--|
| 25 | BUZZ | OUT | Signal to sound buzzer. A: key touch sound(0.12sec.). B: Completion sound(2.4sec.). |
| 26 | D4 | OUT | Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display. |
| 27 | D5 | OUT | Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display. |
| 28 | D6 | OUT | Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display. |
| 29 | D7 | OUT | Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display. |
| 30 | D8 | OUT | Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display. |
| 31 | R80 | OUT | Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display. |
| 32 | R81 | OUT | Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display. |
| 33 | R82 | OUT | Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display. |
| 34 | R83 | OUT | Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display. |
| 35 | R10 | OUT | Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G8 line keys on key matrix is touched. |
| 36 | R11 | OUT | Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G7 line keys on key matrix is touched. |
| 37 | R12 | OUT | Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G6 line keys on key matrix is touched. |
| 38 | R13 | OUT | Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G5 line keys on key matrix is touched. |

| Pin No. | Signal | I/O | Description |
|---------|--------|-----|---|
| 39 | R20 | OUT | Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G4 line keys on key matrix is touched. |
| 40 | R21 | OUT | Segment data signal. Signal similar to D8. |
| 41 | R22 | OUT | Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G2 line keys on key matrix is touched. |
| 42 | R23 | OUT | Segment data signal. Signal similar to D8. |

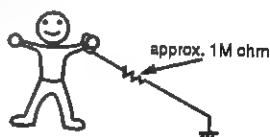
SERVICING

1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
DTA114ES
DTB143ES
DTD143ES
2SA933S



Transistor
2SB910M

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING PRESENTS A HAZARD.

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

- A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

- B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel. It is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC-10MHz type or more advanced model.
- 3) Others: Hand tools

5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal is damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.

6. Discharge the H.V. capacitor before carrying out any further work.
 7. Do not operate the oven with the outer case removed.
- N.B.; Step 1, 2 and 3 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENT OR WIRING.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS
2. Lift up the HVC cover.
3. Disconnect the H.V. wire of the H.V. rectifier assembly from the high voltage transformer.
4. Disconnect the filament lead of the high voltage transformer from the H.V. capacitor.
5. Remove one (1) screw holding capacitor holder to rear cabinet.
6. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly, and remove capacitor holder.
7. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.

8. Disconnect the H.V. wire A from the H.V. rec. assy.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH AN EARTHING SCREW.

CAUTION: DO NOT REPLACE ONLY HIGH VOLTAGE RECTIFIER. WHEN REPLACING IT, REPLACE HIGH VOLTAGE RECTIFIER ASSEMBLY.

9. Now H.V. rectifier, assy. and H.V. capacitor should be free.

HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the wire leads main wire harness and H.V. wire from high voltage transformer.
3. Release the lead of the high voltage transformer from the wire holder.
4. Disconnect the lead from magnetron filament.

5. Disconnect the lead of the high voltage transformer from high voltage capacitor.
6. Remove the four (4) screws holding the transformer to bottom plate.
7. Remove the transformer.

CONTROL PANEL REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect all the leads and connectors from the control unit.
3. Remove the one (1) screw holding the control panel to the front plate of the oven cavity.
4. Lift up the control panel and release it from the oven cavity.
5. Now, the control panel assembly is free.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from magnetron.
3. Remove the four (4) screws holding the magnetron to the waveguide.
4. Remove the magnetron from waveguide.
5. Remove the two (2) screws holding the magnetron duct to the magnetron.
6. Remove the magnetron duct from the magnetron.
7. Remove the single (1) screw holding the air guide to the magnetron.
8. Remove the air guide from the magnetron.
9. Now, the magnetron is free.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

FAN MOTOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the fan motor and thermal cut-out.
3. Tear the wire holder B holding the filament lead of the high voltage transformer and the H.V. wire A.
4. Remove the one (1) screw holding the chassis support to the oven cavity front plate.
5. Push the tab at the end of the chassis support caught on the rear cabinet of the oven cavity.
6. Remove the chassis support by pulling it.
7. Remove the magnetron referring to "MAGNETRON REMOVAL".
8. Release the snap band of the main wire harness from the light mount plate.
9. Release the filament lead of the high voltage transformer and the H.V. wire A from the fan duct.
10. Release the fan motor assembly from the oven cavity.
11. Remove the one (1) screw from the thermal cut-out angle.
12. Remove the fan blade from the fan motor shaft according to the following procedure.
 - 1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

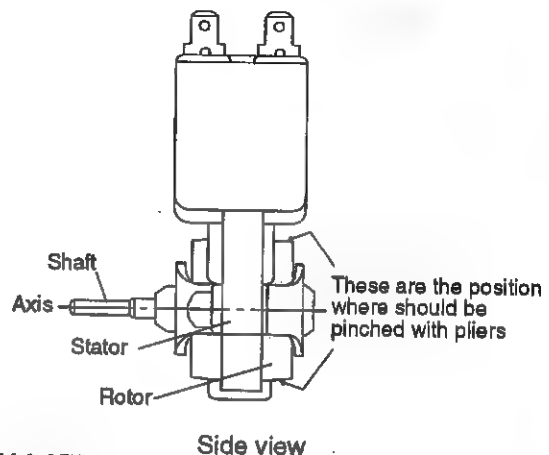
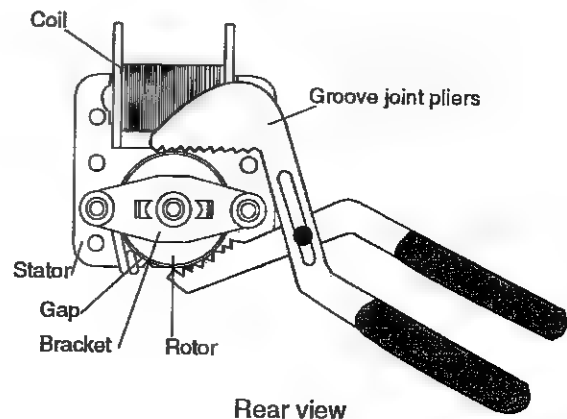
- Make sure that any pieces do not enter the gap between the rotor and the stator of the fan motor. Because the rotor is easy to be shaven by pliers and metal pieces may be produced.
- Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.
- Do not transform the bracket by touching with the pliers.

- 2) Remove the fan blade assembly from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
- 3) Now, the fan blade will be free.

CAUTION:

- Do not use this removed fan blade again. Because the hole(for shaft) of it may become bigger than a standard one.

13. Remove the two (2) screws holding the fan motor to the fan duct.
14. Now, the fan motor is free.



INSTALLATION

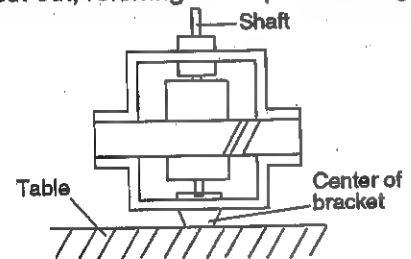
1. Install the fan motor to the fan motor angle with the two (2) screws.
2. Install the fan blade to the fan motor shaft according to the following procedure.
 - 1) Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
 - 2) Apply the screw lock tight into the hole(for shaft) of the fan blade.
 - 3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

CAUTION:

- Do not hit the fan blade strongly when installed because the bracket may be transformed.
 - Make sure that the fan blade rotates smooth after installed.
 - Make sure that the axis of the shaft is not slanted.
3. Install the thermal cut-out angle to the fan motor with the one (1) screw.
 4. Install the fan motor assembly to the oven cavity by inserting the tabs of the fan duct into the holes of the oven cavity.
 5. Re-install the magnetron, together with the fan duct, to the waveguide of the oven cavity with the four (4) screws.
 6. Insert the end of the chassis support into the slit of the oven cavity rear cabinet.
 7. Re-install the chassis support to the oven cavity front

plate with the one (1) screw.

8. Install the main wire harness into the hole of the fan duct and insert the snap band of the main wire harness into the hole of the light mount plate.
9. Install the filament lead and the H.V. wire A into the hole of the fan duct and tie them with the wire holder B.
10. Connect the wire leads to the fan motor and the thermal cut-out, referring to the pictorial diagram.



OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the flat type small screw driver.
3. Tear the cushion from the light mount plate.
4. Bend the tab of the light mount plate holding the oven.
5. Lift up the oven lamp socket.
6. Now, the oven lamp socket is free.

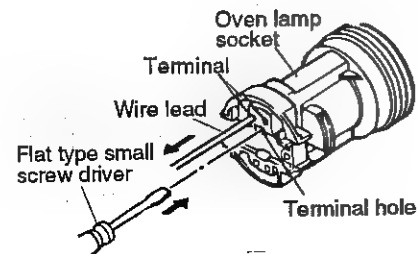


Figure C-1. Oven lamp socket

POSITIVE LOCK® CONNECTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Pushing the lever of positive lock® connector.
3. Pull out the positive lock® connector.

CAUTION:

When you (Service engineers) connect the positive lock® connectors to the terminals, connect the positive lock® so that the lever face you (Service engineers).

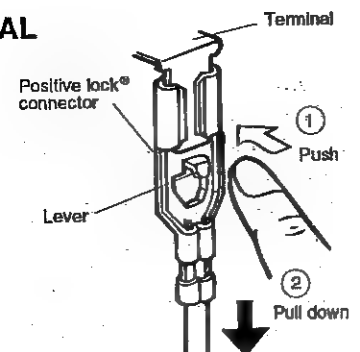


Figure C-2 Positive lock® connector

TURNTABLE MOTOR REPLACEMENT

Removal

1. Disconnect the oven from the power supply.
2. Remove the turntable and roller stay from the oven cavity.
3. Turn the oven over.
4. Cut the four (4) bridges holding the turntable motor cover to the bottom plate L with the cutting pliers as shown in Figure C-3 (a).

CAUTION: DO NOT DROP THE TURNTABLE MOTOR COVER INTO THE OVEN AFTER CUTTING THE BRIDGES. BECAUSE IT WILL DAMAGE THE WIRELEADS OF THE MOTOR AND IT IS DIFFICULT TO REMOVE IT OUT OF THE OVEN.

5. Remove the turntable motor cover from the bottom plate L.

6. Disconnect the wire leads from the turntable motor.
7. Remove the single (1) screw holding the turntable motor to the oven cavity.
8. Remove the turntable motor from the oven cavity.
9. Remove the O-ring and washer from the turntable motor.
10. Now, the turntable motor is free.

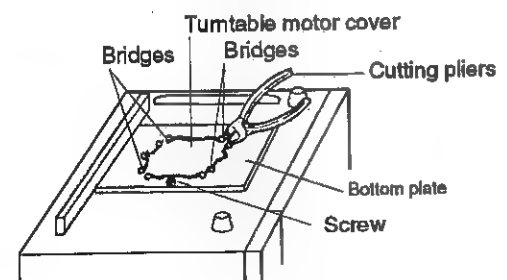


Figure C-3(a). Turntable Motor Cover Removal

Re-install

1. Remove the any sharp edges on the turntable motor cover and the bottom plate L with the cutting pliers.
2. Remove the single (1) screw on the bottom plate as shown in Figure C-3 (a).
3. Re-install the O-ring.
4. Apply the grease (Shinetsu silicone grease G-420 of Shinetsu Chemical Co. Ltd. or Toray Silicone grease SH-14 of Toray Silicone Co., Ltd.) to the O-ring and the roots of the turntable motor shaft as shown in Figure C-4.
5. Re-install the turntable motor with the O-ring and washer to the oven cavity with the single (1) screw.
6. Re-connect the wire leads to the turntable motor.
7. Insert the tab of the turntable motor cover into the hole of the bottom plate as shown in Figure C-3(b).

8. Re-install the turntable motor cover to the bottom plate L with the screw which are removed at the above step 2 as shown in Figure C-3(b).

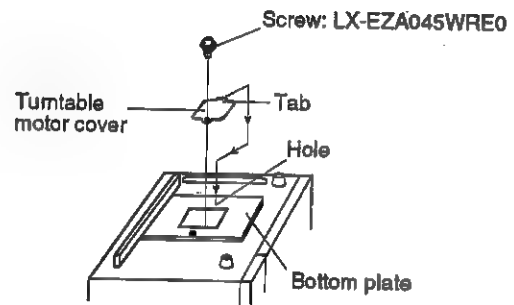


Figure C-3(b). Turntable Motor Cover Re-Install

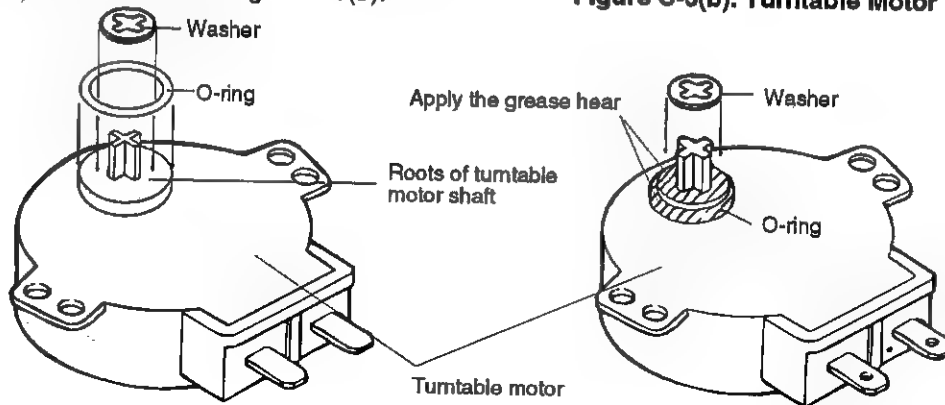


Figure C-4. Washer and O-ring Installation and Grease Applying.

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the green/yellow wire and the earth angle to the oven cavity.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-5 (a).
4. Release the power supply cord from the rear cabinet, referring to the Figure C-5 (b).
5. Now, the power supply cord is free.

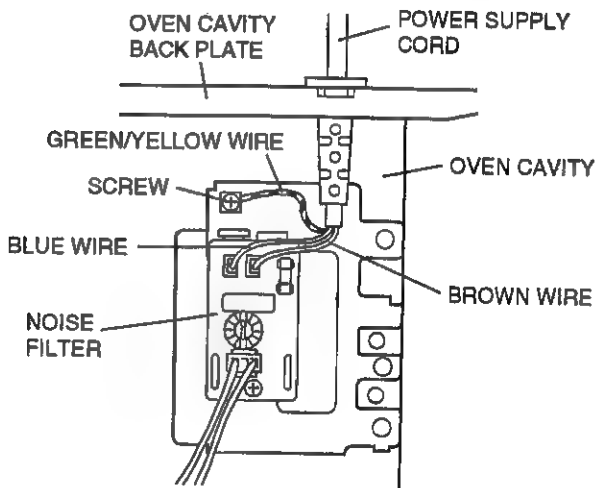


Figure C-5(a). Power Supply Cord Replacement

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-5 (b).
2. Install the earth wire lead of power supply cord and the earth angle to the oven cavity with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

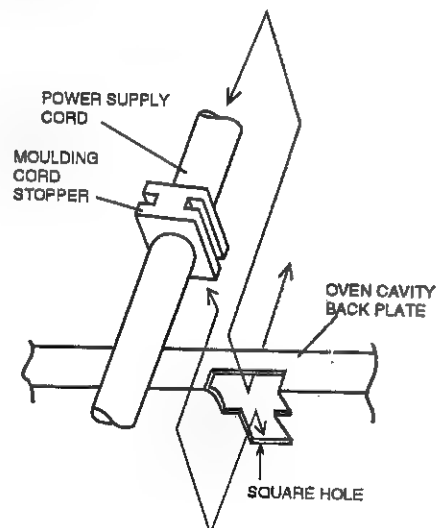


Figure C-5 (b) Replacement of Power Supply Cord

1ST., 2ND., 3RD. LATCH SWITCH, MONITOR SWITCH AND STOP SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL REPLACEMENT".
3. Remove the switch lever from the oven cavity front plate by making the tab of the oven cavity front plate flat.
4. Disconnect the leads from all switches.
5. Remove the two (2) screws holding the latch hook to the oven cavity.
6. Remove the latch hook.
7. Remove the switch(s) from the latch hook by pushing the retaining tab backwards slightly and turning the switch(s) on the post.
8. Now, the switch(s) is free.

NOTE: The 3rd latch switch is at the lower backside of the latch hook.

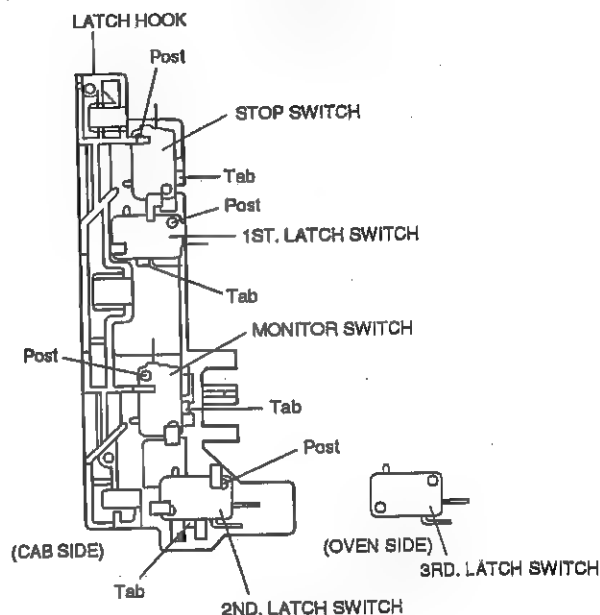


Figure C-6 Switches

1ST., 2ND., 3RD. LATCH SWITCHES, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the 1st latch switch, 2nd latch switch, 3rd latch switches, stop switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With the door closed, adjust the latch hook by moving it back and forward. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the stop switch and monitor switch have activated with the door closed.
The vertical position of the latch hook should be placed where the 1st latch, 2nd latch and 3rd latch switches have activated with the door closed.
4. Secure the screws with washers firmly.
5. Make sure of the 1st latch, 2nd latch, 3rd latch switches, stop switch and monitor switch operation. If those switches have not activated with the door closed, two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:

1. In and out play of door remains less than 0.5 mm when latched position. First check latch hook position, pushing and pulling the door toward the oven face. The results (play of the door) should be less than 0.5mm.
2. The 1st latch, 2nd latch and 3rd latch switches interrupt the circuit before the door can be opened.

3. The monitor switch contacts close when the door is opened.
4. The stop switch contacts open when the door is opened.
5. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

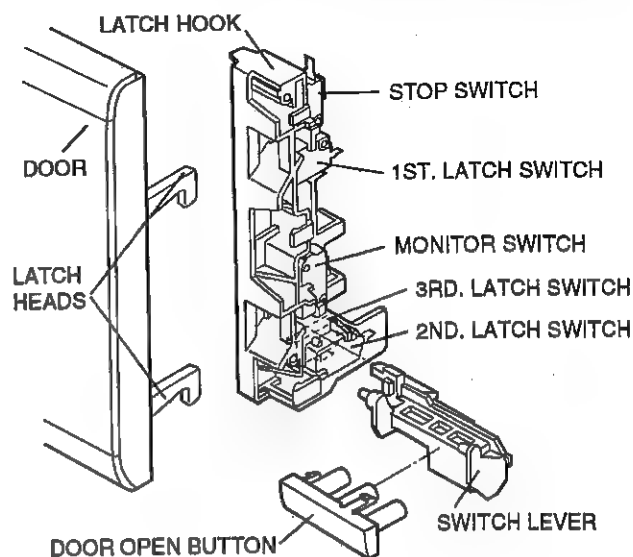


Figure C-7. Latch Switches Adjustment

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

1. CARRY OUT 3D CHECKS
2. Remove two (2) screws holding the lower oven hinge to the bottom plate L. The lower oven hinge is now free.
3. Open the door by pushing the door open button.

4. Remove door assembly from the upper oven hinge by pulling it forward.
5. Re-install the door assembly to the upper oven hinge.
6. On re-installing new door assembly, secure the lower oven hinge with the two (2) mounting screws to the oven

cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch heads pass through the latch holes correctly.

7. CARRY OUT 4R CHECKS

Note: After any service to the door, an approved microwave survey meter should be used to assure compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure.)

DOOR ADJUSTMENT

When removing and/or loosening hinges such as in door replacement, the following adjustment criteria are taken. Door is adjusted to meet the following three conditions by keeping screws of hinge loose.

1. Adjust door latch heads at a position where they smoothly catch the latch hook through the latch holes. Refer to latch switch adjustments.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. The door is positioned with its face depressed toward the cavity face plate.
4. Reinstall outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

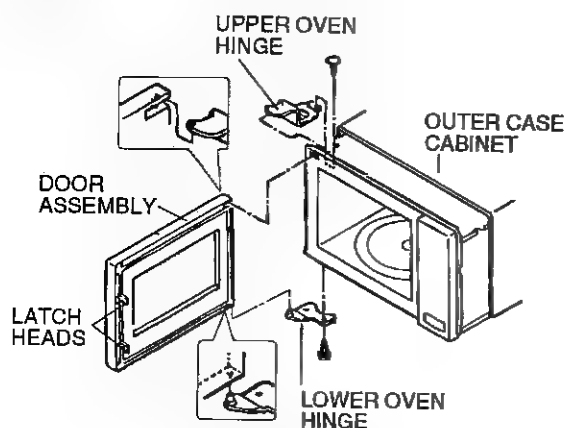


Figure C-8. Door Assembly Replacement and Adjustment

CHOKE COVER REMOVAL

1. Insert an iron plate (thickness of about 0.5mm) or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engaging part.
2. Lift up the choke cover, now cover is free.

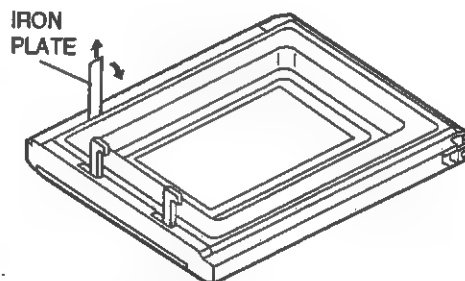


Figure C-9. Choke Cover Removal

DOOR PARTS REMOVAL

Remove the door assembly, referring to from item 1 through item 4 of "DOOR REPLACEMENT".

1. Place the door assembly on a soft cloth with facing up.
2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".

LATCH HEAD REMOVAL AND DOOR FRAME

3. Remove the door screen from the door frame.
4. Remove the four (4) screws holding the door panel to the door frame.
5. Remove the door frame from the door panel. Now, the door frame is free.
6. Release the latch spring from the tabs of the latch head.
7. Release the latch head from the door panel.
8. Now, the latch head is free.

SEALER FILM

Removal

1. Tear the sealer film from the door panel.
2. Now, the sealer film is free.

Installation

1. Put the adhesive tape on the backing film of the sealer film as shown in Fig. 10.
2. Tear the backing film by pulling the adhesive tape.
3. Put the pasted side of the sealer film on the door panel.

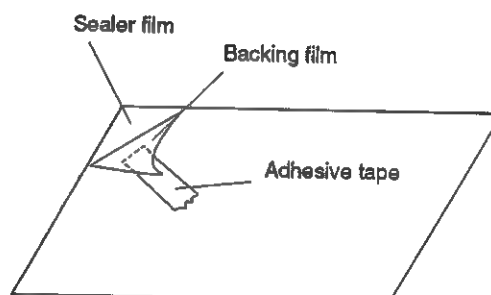


Figure C-10. Sealer film

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm^2 at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

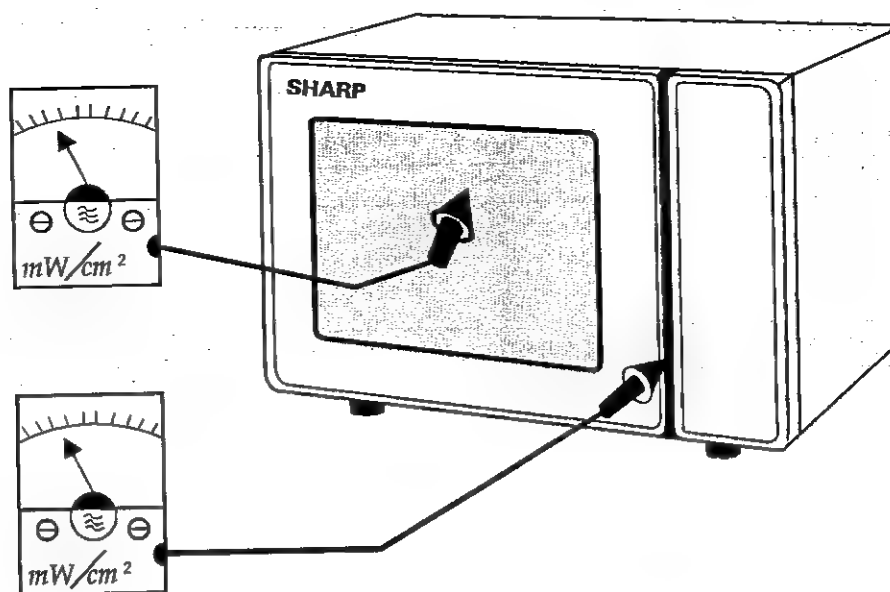
Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
Important:
Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

NARDA 8100
NARDA 8200
HOLADAY HI 1500
SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of $275 \pm 15\text{ml}$ of water initially at $20 \pm 5^\circ\text{C}$ in the center of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster than 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

TEST DATA AT A GLANCE

| Parts | Symbol | Value / Data |
|--------------------------|--------|---|
| Weak point | F | F7.4A 250V |
| Monitor resistor | R1 | 4.3Ω 20W |
| Surge resistor | R2 | 10Ω 20W |
| Temp. fuse (MG) | TF1 | 150°C |
| Temp. fuse (OVEN) | TF2 | 150°C |
| Thermal cut-out | TC | 95°C |
| Oven lamp | OL | 220-230 V 25W E14 |
| High voltage capacitor | C | 1.07μF AC 2100V |
| Magnetron | MG | Filament < 1Ω Filament - chassis ∞ ohm. |
| High voltage transformer | T | Filament winding < 1Ω Secondary winding Approx. 96.9Ω Primary winding Approx. 1.34Ω |

TEST POINT ON CONTROL UNIT

| In/Out pit terminal | Test Point | Volt | Resistance (Disconnect the power plug and close the door.) |
|---|-----------------|------------|--|
| Input terminal (Power supply) | A3 - A5 | 220 - 230V | Approx. 1365 ohm. |
| Input terminal (Stop switch) | B1 - B2 | - | Approx. 0.1 ohm. |
| Output terminal (Oven lamp, Fan motor, Turntable motor) | A1 - A3 | 220 - 230V | Approx. 124 ohm. |
| Output terminal (High voltage transformer) | A3 - No. of RY2 | 220 - 230V | Approx. 2.0 ohm. |
| Output terminal (Earth) | B2 - Chassis | - | Approx. 0.1 ohm. |

WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSE
2. CLOCK APPEARS ON DISPLAY

1. AC CORD CONNECTION
BRN: BROWN
BLU: BLUE
G-Y: GREEN AND
YELLOW STRIPE
/17 : SECTIONAL AREA
OF 1.0mm²MIN.

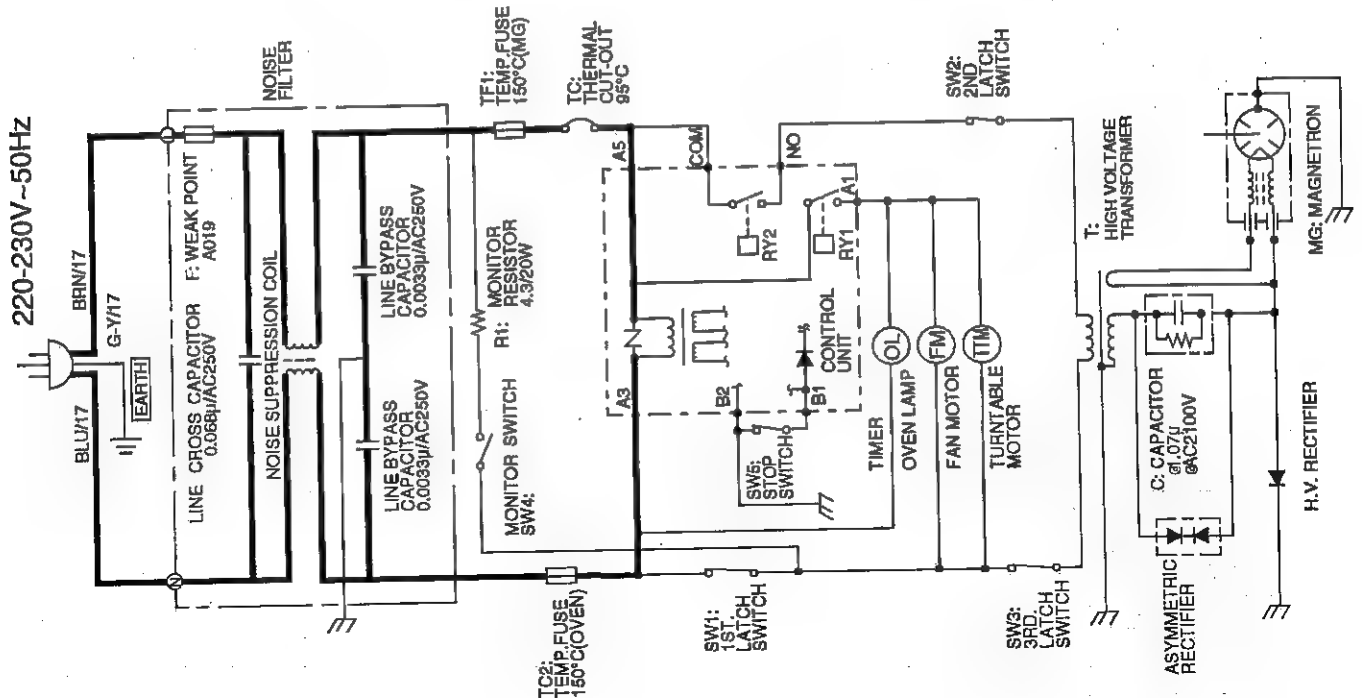


Figure O-1 Oven Schematic-OFF Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSE
2. COOKING TIME PROGRAMMED
3. START PAD TOUCHED

1. AC CORD CONNECTION
BRN: BROWN
BLU: BLUE
G-Y: GREEN AND
YELLOW STRIPE
/17 : SECTIONAL AREA
OF 1.0mm²MIN.

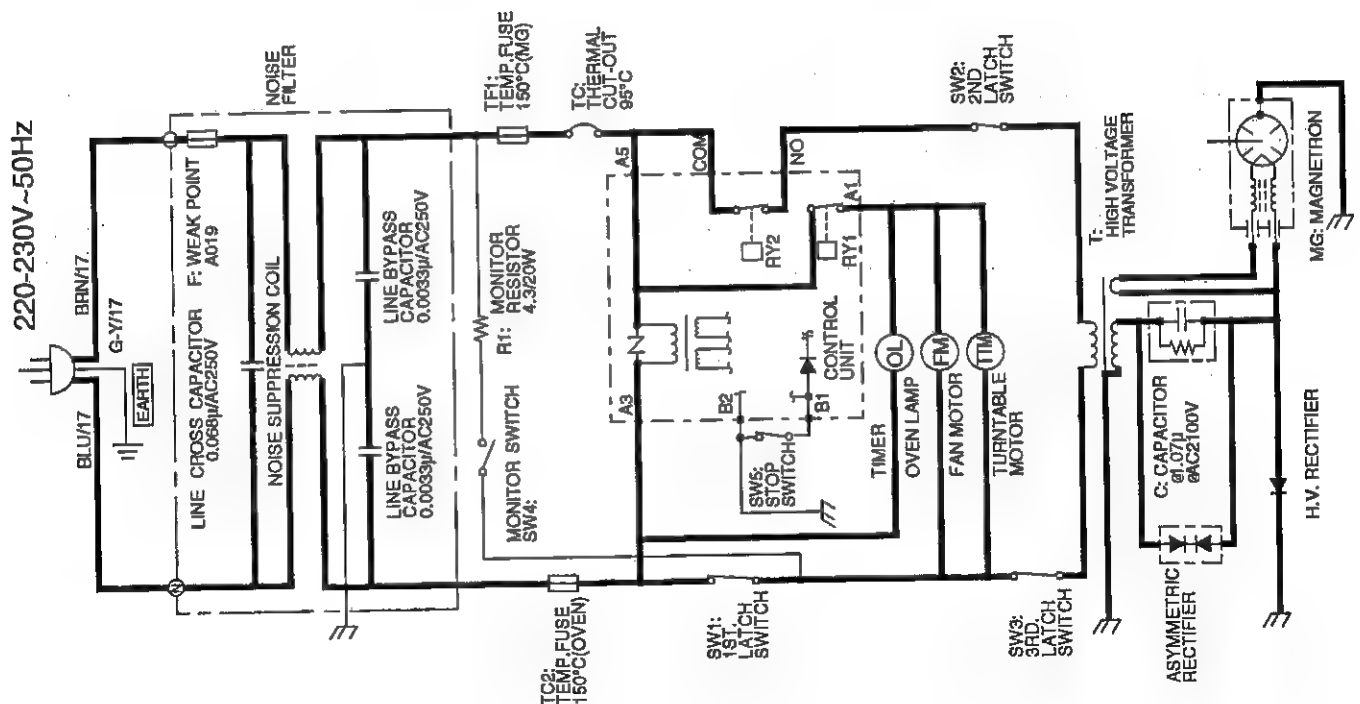


Figure O-2 Oven Schematic-ON Condition

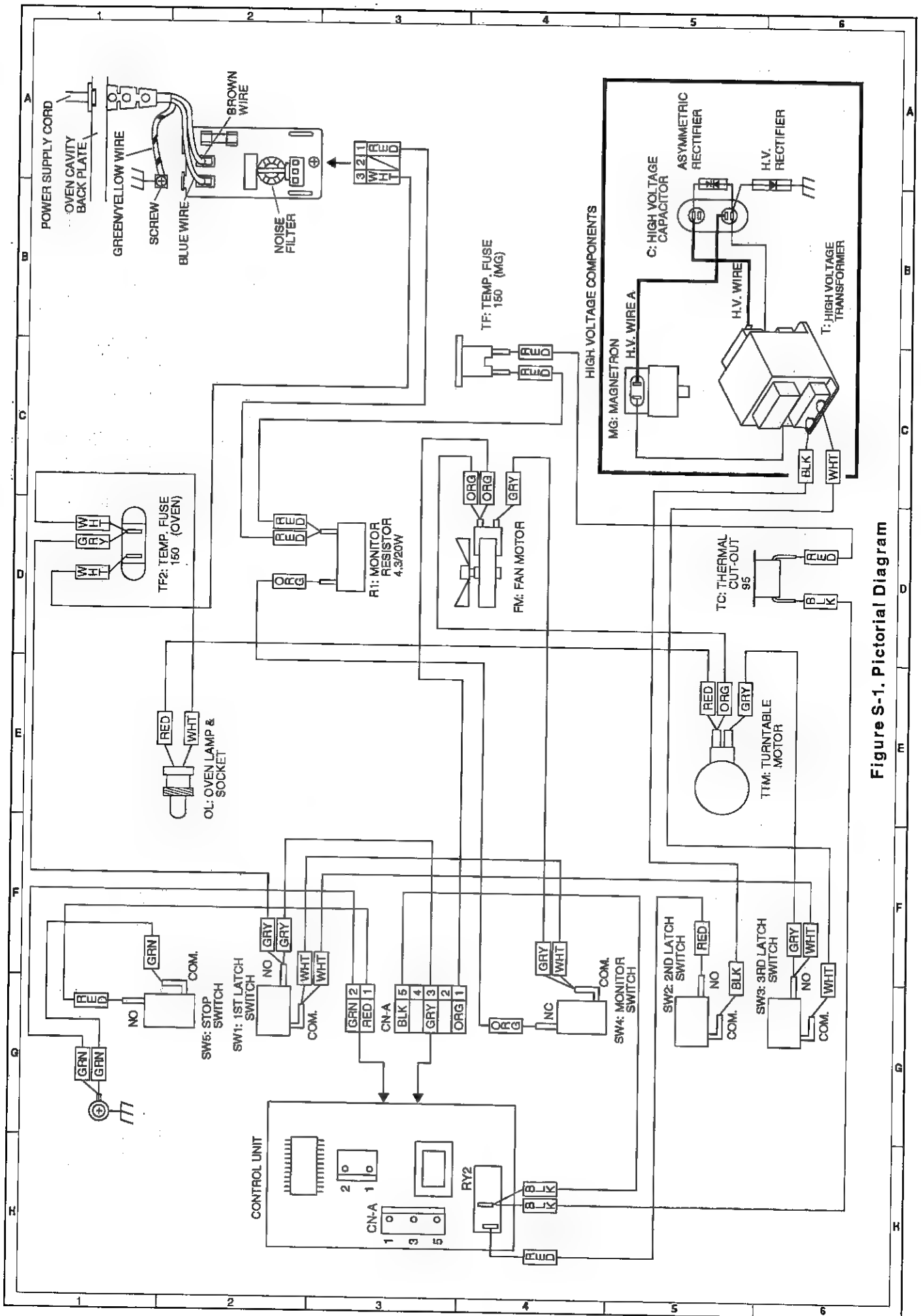
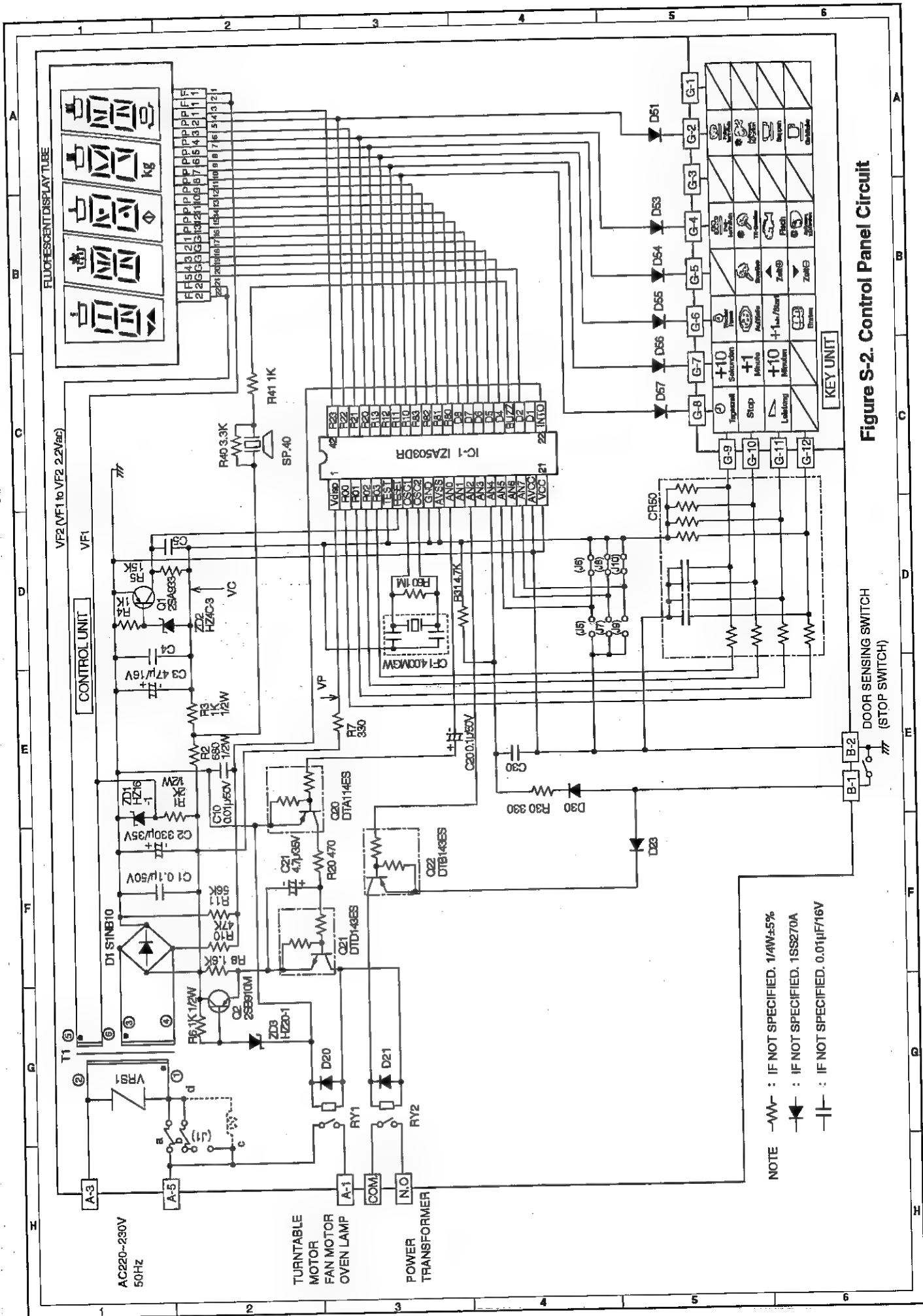


Figure S-1. Pictorial Diagram



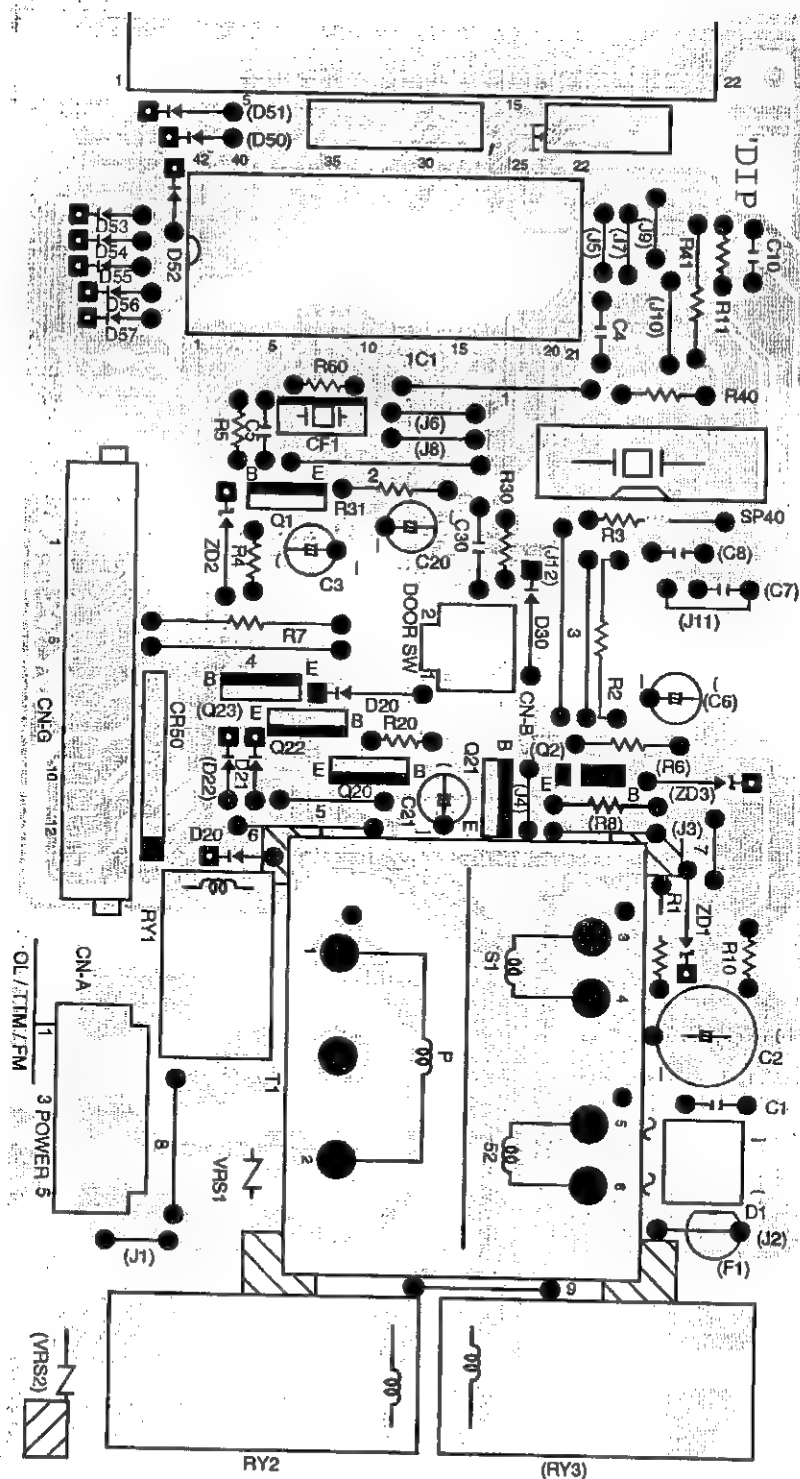


Figure S-3. Printed Wiring Board

PARTS LIST

Note: The parts marked "*" are used in voltage more than 250V.

| REF. NO. | PART NO. | DESCRIPTION | QTY | CODE |
|----------|----------|-------------|-----|------|
|----------|----------|-------------|-----|------|

ELECTRIC PARTS

| | | | | |
|-------|---------------|---------------------------------|---|----|
| * C | RC-QZA095WRE0 | High voltage capacitor | 1 | AX |
| F | QFS-CA019WRE0 | Weak point | 1 | AE |
| FM | RMOTEA265WRE0 | Fan motor | 1 | AZ |
| * MG | RV-MZA175WRE0 | Magnetron | 1 | BL |
| OL | RLMPTA028WRE0 | Oven lamp | 1 | AK |
| R1 | RR-WZA024WRE0 | Monitor resistor 4.3 OHM 20W | 1 | AH |
| SW1 | QSW-MA110WRE0 | 1st. latch switch | 1 | AK |
| SW2 | QSW-MA110WRE0 | 2nd. latch switch | 1 | AK |
| SW3 | QSW-MA110WRE0 | 3rd. latch switch | 1 | AK |
| SW4 | QSW-MA111WRE0 | Monitor switch | 1 | AK |
| SW5 | QSW-MA110WRE0 | Stop switch | 1 | BT |
| * T | RTRN-A379WRE0 | High voltage transformer | 1 | AM |
| TC | RTHM-A072WRE0 | Thermak cut-out 95°C | 1 | AG |
| TF1 | QFS-TA013WRE0 | Temperature fuse 150°C (MG) | 1 | AG |
| TF2 | QFS-TA013WRE0 | Temperature fuse 150°C (OVEN) | 1 | AG |
| * TTM | RMOTDA173WRE0 | Turntable motor | 1 | AX |
| 1- 1 | FH-DZA045WRK0 | High voltage rectifier assembly | 1 | AW |
| 1- 2 | FPWBFA269WRK0 | Noise filter | 1 | AV |
| 1- 3 | QACCVA058WRE0 | Power supply cord | 1 | AX |
| 1- 4 | QSOCLA011WRE0 | Oven lamp socket | 1 | AH |

CABINET PARTS

| | | | | |
|------|---------------|------------------------|---|----|
| 2- 1 | GCABUA411WRP0 | Outer case cabinet (B) | 1 | BC |
| 2- 1 | GCABUA422WRP0 | Outer case cabinet (W) | 1 | BC |
| 2- 2 | GDAI-A236WRW0 | Bottom plate L | 1 | AN |
| 2- 3 | GDAI-A237WRW0 | Bottom plate R | 1 | AQ |
| 2- 4 | GLEGPA023WRE0 | Foot | 2 | AB |

CONTROL PANEL PARTS

| | | | | |
|--------|---------------|--------------------------------|---|----|
| 3- 1 | CPWBFA546WRK0 | Control unit | 1 | BR |
| 3- 1A | QCNCMA234DRE0 | 3-pin connector (A) | 1 | AC |
| 3- 1B | QCNCMA275DRE0 | 2-pin connector (B) | 1 | AB |
| 3- 1C | QCNCWA030DRE0 | 12-pin connector (G) | 1 | AE |
| 3- 1D | RV-KXA057DRE0 | Fluorescent display tube | 1 | AX |
| 3- 1E | PCUSGA381WRP0 | Cushion | 1 | AG |
| 3- 1F | PTUB-A003DRE0 | Tube | 1 | AG |
| C1 | RC-KZA087DRE0 | Capacitor 0.1 uF 50V | 1 | AB |
| C2 | VCEAB31VW337M | Capacitor 330 uF 35V | 1 | AC |
| C3 | VCEAB31CW476M | Capacitor 47 uF 16V | 1 | AA |
| C4-5 | VCKYD11CY103N | Capacitor 0.01 uF 16V | 2 | AH |
| C10 | VCTYF31HF103Z | Capacitor 0.01 uF 50V | 1 | AB |
| C20 | VCEAB31HW104M | Capacitor 0.1 uF 50V | 1 | AM |
| C21 | VCEAB31VW475M | Capacitor 4.7 uF 35V | 1 | AA |
| C30 | VCKYD11CY103N | Capacitor 0.01 uF 16V | 1 | AH |
| CF1 | RCRS-A012DRE0 | Ceramic resonator (CST4.00MGW) | 1 | AD |
| CR50 | RMPTEA011DRE0 | CR array | 1 | AL |
| D1 | RSRCDA013DRE0 | Diode bridge (S1NB10) | 1 | AG |
| D20-21 | VHD1SS270A/-1 | Diode (1SS270A) | 2 | AA |
| D23 | VHD1SS270A/-1 | Diode (1SS270A) | 1 | AA |
| D30 | VHD1SS270A/-1 | Diode (1SS270A) | 1 | AA |
| D51 | VHD1SS270A/-1 | Diode (1SS270A) | 1 | AA |
| D53-57 | VHD1SS270A/-1 | Diode (1SS270A) | 5 | AA |
| IC1 | RH-IZA503DRE0 | LSI | 1 | AT |
| Q1 | VS2SA933S/-3 | Transistor (2SA933S) | 1 | AB |
| Q2 | VS2SB910MR/-4 | Transistor (2SB910M) | 1 | AE |
| Q20 | VSDTA114ES/-3 | Transistor (DTA114ES) | 1 | AB |
| Q21 | VSDTD143ES/-3 | Transistor (DTD143ES) | 1 | AC |
| Q22 | VSDTB143ES/-3 | Transistor (DTB143ES) | 1 | AC |
| R1 | VRD-B12HF202J | Resistor 2k ohm 1/2W | 1 | AB |
| R2 | VRD-B12HF681J | Resistor 680 ohm 1/2W | 1 | AA |
| R3 | VRD-B12HF102J | Resistor 1k ohm 1/2W | 1 | AA |
| R4 | VRD-B12EF102J | Resistor 1k ohm 1/4W | 1 | AA |
| R5 | VRD-B12EF153J | Resistor 15k ohm 1/4W | 1 | AA |
| R6 | VRD-B12HF102J | Resistor 1k ohm 1/2W | 1 | AA |
| R7 | VRD-B12EF331J | Resistor 330 ohm 1/4W | 1 | AA |
| R8 | VRD-B12EF162J | Resistor 1.6k ohm 1/4W | 1 | AB |
| R10 | VRD-B12EF473J | Resistor 47k ohm 1/4W | 1 | AA |

Note: The parts marked "*" are used in voltage more than 250V.

| REF. NO. | PART NO. | DESCRIPTION | Q'TY | CODE |
|----------|---------------|---------------------------------|------|------|
| R11 | VRD-B12EF563J | Resistor 56k ohm 1/4W | 1 | AA |
| R20 | VRD-B12EF471J | Resistor 470 ohm 1/4W | 1 | AA |
| R30 | VRD-B12EF331J | Resistor 330 ohm 1/4W | 1 | AA |
| R31 | VRD-B12EF472J | Resistor 4.7k ohm 1/4W | 1 | AA |
| R40 | VRD-B12EF332J | Resistor 3.3k ohm 1/4W | 1 | AA |
| R41 | VRD-B12EF102J | Resistor 1k ohm 1/4W | 1 | AA |
| R60 | VRD-B12EF105J | Resistor 1M ohm 1/4W | 1 | AA |
| RY1 | RRLY-A078DRE0 | Relay (OJ-SH-118LM) | 1 | AG |
| RY2 | RRLY-A092DRE0 | Relay (VRB18SP) | 1 | AL |
| SP40 | RALM-A014DRE0 | Buzzer (PKM22EPT-CA) | 1 | AG |
| T1 | RTRNPA082DRE0 | Transformer | 1 | AX |
| VRS1 | RH-VZA032DRE0 | Varistor (10G471K) | 1 | AH |
| ZD1 | VHEHZ161///-1 | Zener diode (HZ16-1) | 1 | AA |
| ZD2 | VHEHZ4C3///-1 | Zener diode (HZ4C-3) | 1 | AA |
| ZD3 | VHEHZ201///-1 | Zener diode (HZ20-1) | 1 | AA |
| 3- 2 | DUNTKA589WRK0 | Key unit assembly [R-3A65(W)] | 1 | AK |
| 3- 2 | DUNTKA590WRK0 | Key unit assembly [R-3A65(B)] | 1 | AY |
| 3- 3 | GMADIA054WRFO | Display window | 1 | AE |
| 3- 4 | HPNLCB104WRFO | Control panel frame [R-3A65(W)] | 1 | AS |
| 3- 4 | HPNLCB105WRFO | Control panel frame [R-3A65(B)] | 1 | AS |
| 3- 5 | JBTN-A863WRFO | Open button [R-3A65(W)] | 1 | AK |
| 3- 5 | JBTN-A864WRFO | Open button [R-3A65(B)] | 1 | AK |
| 3- 6 | MSPRCA050WRE0 | Open button spring | 1 | AB |
| 3- 7 | XEPSD30P10XS0 | Screw; Control unit mtg. | 2 | AA |

OVEN PARTS

| | | | | |
|------|---------------|----------------------|---|----|
| 4- 1 | FROLPA065WRK0 | Roller stay | 1 | AX |
| 4- 2 | NTNT-A034WRFO | Turntable | 1 | AM |
| 4- 3 | NFANJA029WRE0 | Fan blade | 1 | AL |
| 4- 4 | PDUC-A535WRWO | fan duct | 1 | AQ |
| 4- 5 | LANGQA343WRPO | Fan thermo angle | 1 | AK |
| 4- 6 | PHOK-A086WRFO | Latch hook | 1 | AQ |
| 4- 7 | LANGQA365WRWO | Light mounting plate | 1 | AQ |
| 4- 8 | LBNDKA038WRPO | Capacitor holder | 1 | AF |
| 4- 9 | FHNG-A096WRT0 | Lower oven hinge | 1 | AK |
| 4-10 | FOVN-A283WRT0 | Oven cavity | 1 | BF |
| 4-11 | GLEGPA051WRFO | Leg | 1 | AK |
| 4-12 | PCUSGA322WRPO | Cushion | 2 | AF |
| 4-13 | LANGTA298WRWO | Chassis support | 1 | AQ |
| 4-14 | MHNG-A337WRT0 | Upper oven hinge | 1 | AH |
| 4-15 | MLEVPA206WRFO | Switch lever | 1 | AL |
| 4-16 | PCOVPA276WRE0 | Waveguide cover | 1 | AL |
| 4-17 | PCOVPA277WRFO | HVC cover | 1 | AL |
| 4-18 | PCUSUA166WRPO | Cushion | 1 | AC |
| 4-19 | PCUSGA312WRPO | Cushion | 2 | AB |
| 4-20 | PCUSUA193WRPO | Cushion | 1 | AB |
| 4-21 | LANG-A045WRWO | MG angle | 1 | AK |
| 4-22 | PCUSUA235WRPO | Exhaust cushion | 1 | AF |
| 4-23 | PCUSUA376WRPO | Cushion | 2 | AG |
| 4-24 | PFILWA041WRE0 | Lamp filter | 1 | AF |
| 4-25 | PPACGA097WRE0 | O-Ring | 1 | AG |
| 4-26 | LANG-A039WRWO | Magnetron duct | 1 | AL |
| 4-27 | LX-WZA028WRE0 | Washer | 1 | AB |

DOOR PARTS

| | | | | |
|------|---------------|-------------------|---|----|
| 5 | DDORFA679WRK0 | Door assembly (W) | 1 | BF |
| 5 | DDORFA680WRK0 | Door assembly (B) | 1 | BF |
| 5- 1 | FDORFA260WRT0 | Door panel | 1 | BD |
| 5- 2 | GCOVHA302WRFO | Choke cover | 1 | AS |
| 5- 3 | GWAKPA281WRFO | Door frame (W) | 1 | AW |
| 5- 3 | GWAKPA282WRFO | Door frame (B) | 1 | AW |
| 5- 4 | HPNL-A511WRR0 | Door screen (W) | 1 | AW |
| 5- 4 | HPNL-A512WRR0 | Door screen (B) | 1 | AW |
| 5- 5 | LSTPPA122WRFO | Latch head | 1 | AM |
| 5- 6 | MSPRTA084WRE0 | Latch spring | 1 | AB |
| 5- 7 | PSHEPA333WRE0 | Sealer film | 1 | AE |
| 5- 8 | XEPSD30P06000 | Screw; 3mm X 6mm | 4 | AA |

MISCELLANEOUS

| | | | | |
|------|---------------|-------------------|---|----|
| 6- 1 | TINS-A417WRR0 | Instruction book | 1 | AM |
| 6- 2 | FW-VZB237WRE0 | Main wire harness | 1 | AY |

Note: The parts marked "*" are used in voltage more than 250V.

| REF. NO. X | PART NO. X | DESCRIPTION X | Q'TY | CODE |
|------------|---------------|---------------------|------|------|
| * 6-3 | QW-QZA183WRE0 | High voltage wire A | 1 | AM |
| 6-4 | LBNDKA080WRE0 | Wire holder B | 1 | AD |
| 6-5 | TCAUHA168WRR0 | H Caution label | 1 | AH |
| 6-6 | TSPCNB947WRR0 | Rating label (W) | 1 | AB |
| 6-6 | TSPCNB948WRR0 | Rating label (B) | 1 | AB |
| 6-7 | FW-VZA910WRE0 | Switch harness | 1 | AH |
| 6-8 | UKOG-A007WRE0 | Touch up paint | 1 | AT |
| 6-9 | TLABMA375WRR0 | Menu label | 1 | AE |

SCREWS, NUTS AND WASHERS

| | | | | |
|------|---------------|----------------------|----|----|
| 7-1 | XWUSE40-05000 | Washer; 4mm X 0.5mm | 1 | AA |
| 7-2 | XBTSD40P08RV0 | Screw; 4mm X 8mm | 2 | AA |
| 7-3 | XFPSD30P08000 | Screw; 3mm X 8mm | 2 | AA |
| 7-4 | XVPSD40P20000 | Screw; 4mm X 20mm | 1 | AA |
| 7-5 | XOTSD40P12000 | Screw; 4mm X 12mm | 9 | AA |
| 7-6 | XHTSD40P08RV0 | Screw; 4mm X 8mm | 1 | AA |
| 7-7 | XOTSD40P12RV0 | Screw; 4mm X 12mm | 13 | AA |
| 7-8 | LX-CZ0052WRE0 | Special screw | 2 | AA |
| 7-9 | LX-EZA045WRE0 | Special screw | 5 | AA |
| 7-10 | XOTSE40P08000 | Screw; 4mm X 8mm (W) | 4 | AA |
| 7-10 | XOTSF40P08000 | Screw; 4mm X 8mm (B) | 4 | AA |
| 7-11 | XFPSD40P08K00 | Screw; 4mm X 8mm | 2 | AA |
| 7-12 | XFPSD40P08000 | Screw; 4mm X 8mm | 10 | AA |
| 7-13 | XWHNZ40-10080 | Washer; 4mm X 1.0mm | 1 | AA |

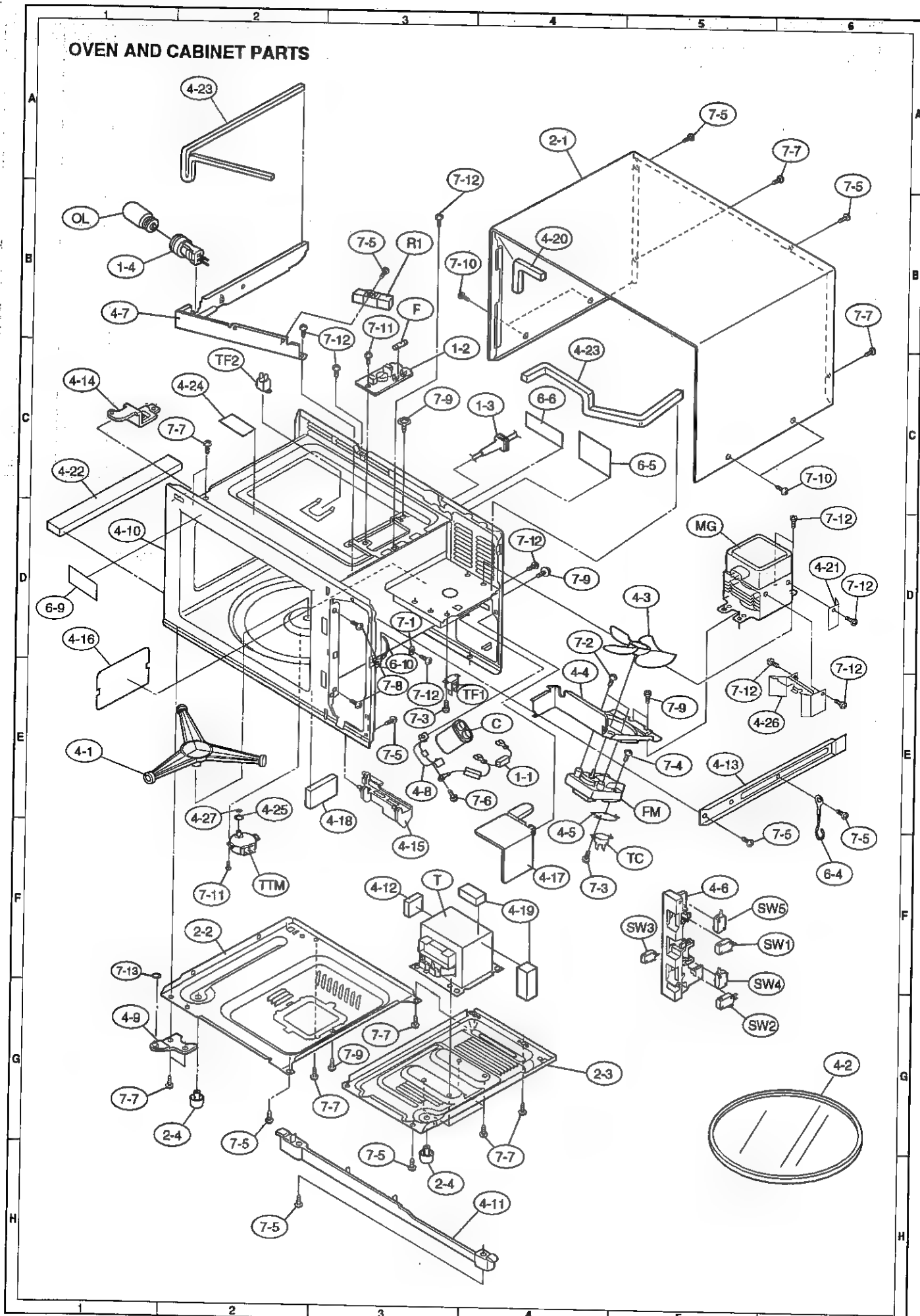
HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

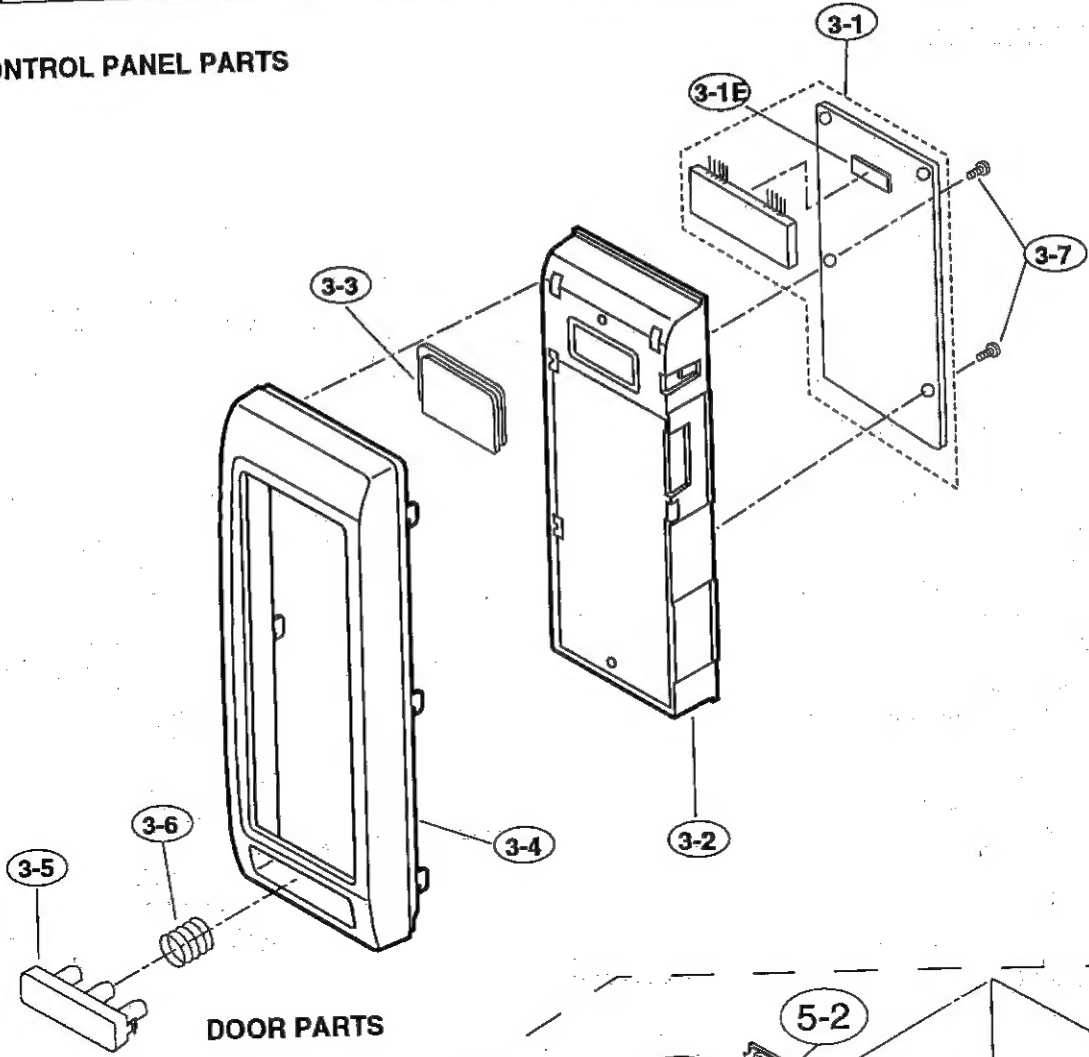
1. MODEL NUMBER
3. PART NO.

2. REF. NO.
4. DESCRIPTION

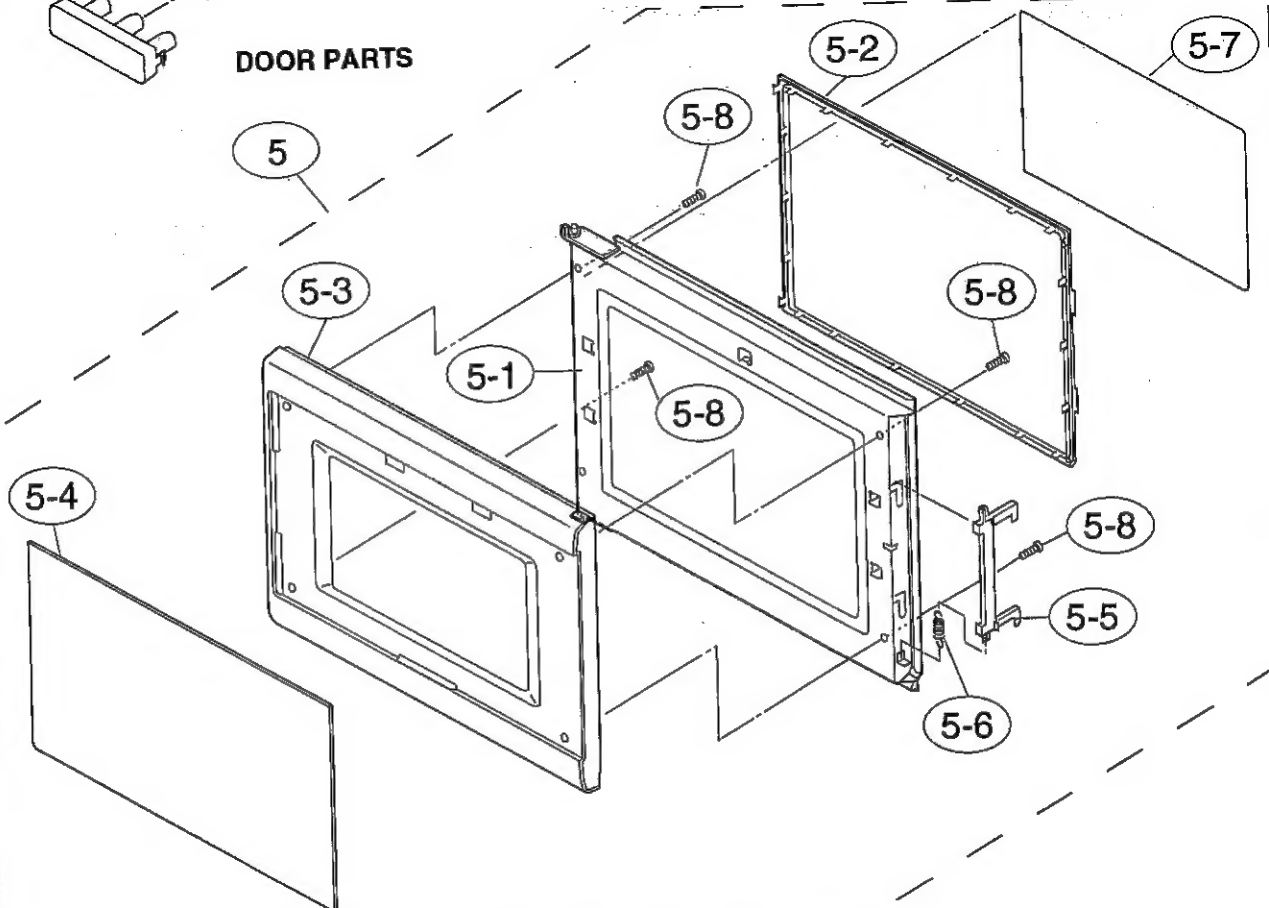
OVEN AND CABINET PARTS



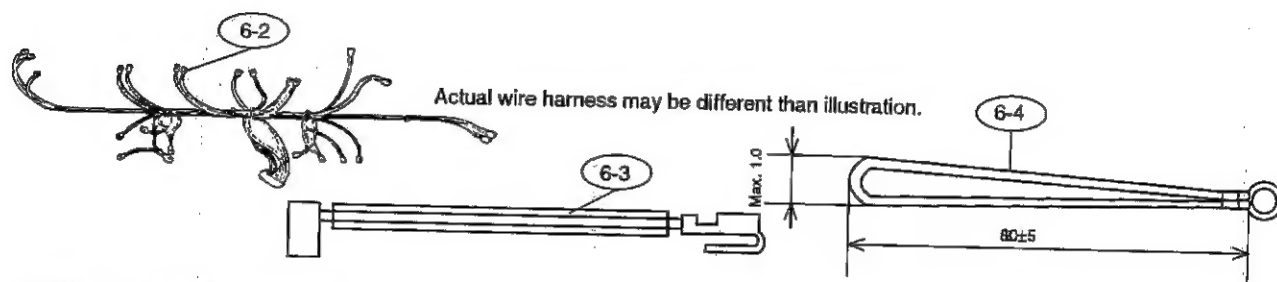
CONTROL PANEL PARTS



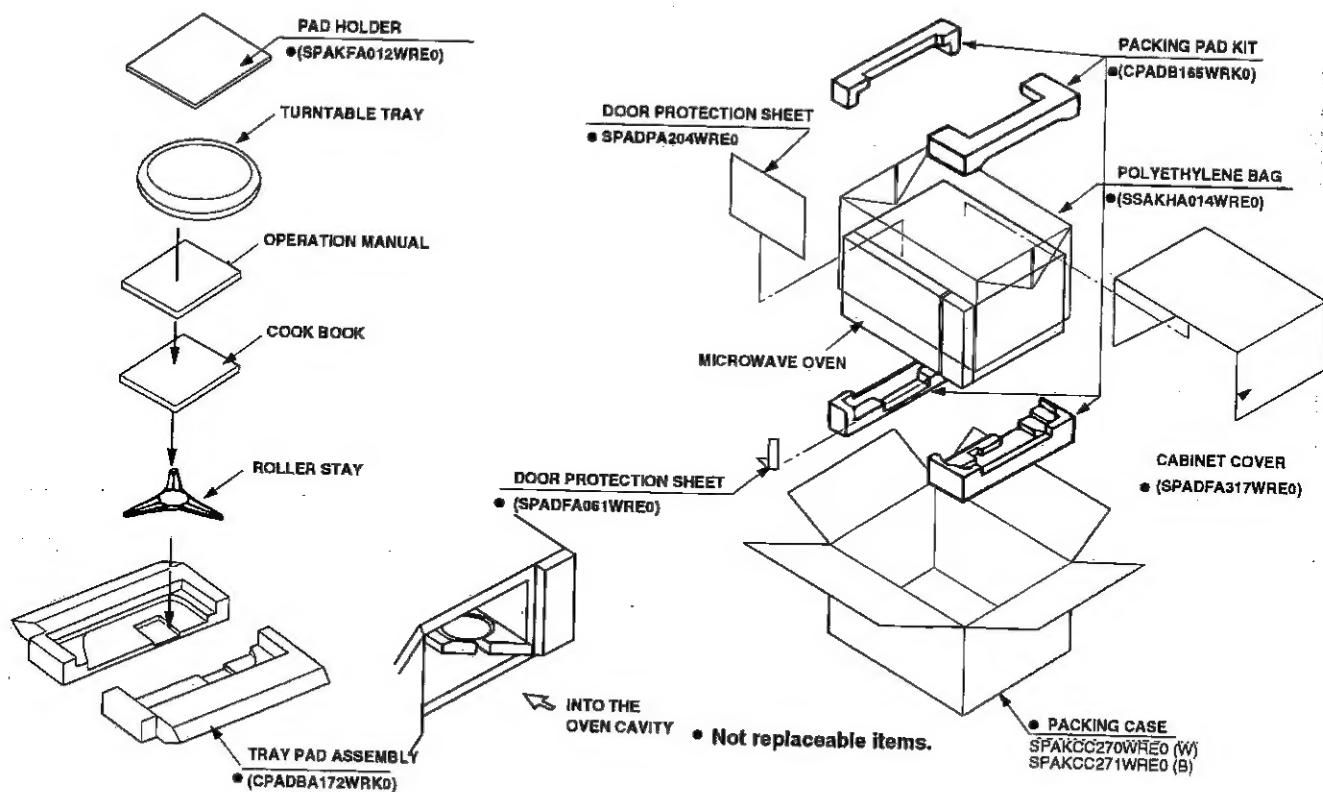
DOOR PARTS



MISCELLANEOUS



PACKING AND ACCESSORIES



SHARP®